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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/023,667 | 12/21/2001 | Takashi Iizuka | P21408 | 6315 |

7055 7590 09/10/2003

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RESTON, VA 20191

EXAMINER

ALLEN, DENISE S

| | |
|----------|--------------|
| ART UNIT | PAPER NUMBER |
|----------|--------------|

2872

DATE MAILED: 09/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/023,667

Applicant(s)

IIZUKA, TAKASHI

Examiner

Denise S Allen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

In light of the Applicant's amendment to the specification on June 20, 2003 (paper #7), the objection to the specification in the Office Action on January 24, 2003 (paper #5) has been withdrawn.

In light of the Applicant's amendment to claims 5 and 6 on June 20, 2003 (paper #7), the objection to claims 5 and 6 in the Office Action on January 24, 2003 (paper #5) has been withdrawn.

Response to Arguments

Applicant's arguments with respect to claims 1 – 8 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1 – 3 and 9 are rejected under 35 U.S.C. 102(a) as being anticipated by Kamikubo (US 6,178,029).

Regarding claims 1 and 9, Kamikubo ('029) teaches a scanning optical system (Figure 1) for exposing a predetermined imaging area (Figure 3 between P₁ and P₂) on a surface (reference 19) to be scanned to a plurality of laser beams (column 3 lines 6 – 17), comprising: a plurality of light sources (references 11 and 12) that emit a plurality of laser beams having different wavelengths (column 5 lines 31 – 33), respectively; a single deflector (reference 17) which deflects the plurality of laser beams simultaneously (Figures 2 and 3); an imaging optical system (reference 18) that converges the plurality of laser beams deflected by said single deflector on

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the surface to be scanned; and a beam detector (reference 20) that receives the plurality of laser beams directed to outside of the predetermined imaging area (outside reference 19) via at least one lens element (references 18a and 18b) included in said imaging optical system, a synchronizing signal being generated upon detection of each of the plurality of light beams by said beam detector (column 5 lines 10 – 16), an optical characteristic of said imaging optical system being configured such that the laser beams directed to said predetermined imaging area are aligned in a scanning direction (Figure 3 reference P₃), while the laser beams directed to said beam detector are shifted in the scanning direction (references L₀ and L₁).

Regarding claim 2, Kamikubo ('029) teaches the single deflector comprises a polygonal mirror having a plurality of reflecting surfaces (column 4 line 47), one of said plurality of reflecting surfaces reflecting the plurality of laser beams during each scan (column 4 lines 50 – 52), said polygonal mirror being rotated so that the laser beams reflected by said reflecting surface scan (column 4 lines 47 – 49).

Regarding claim 3, Kamikubo ('029) teaches the beam detector comprises a single light receiving element (reference 20), each of the plurality of laser beams being incident on said single light receiving element (column 5 lines 10 – 16).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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Claims 4 – 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kamikubo ('029) in view of Kamikubo (US 6,115,164).

Regarding claims 4, 5, and 7, Kamikubo ('029) teaches a scanning optical system as described above. Kamikubo ('029) further teaches the imaging optical system includes at least one refractive lens element (references 18a and 18b). Kamikubo ('029) does not teach a diffractive lens structure formed onto said refractive lens element so that said imaging optical system exhibits said optical characteristic.

Kamikubo ('164) teaches a scanning optical system (Figure 1) with an imaging optical system (references 15, 20, and 30) that includes at least one refractive lens element (i.e. reference 15), and a diffractive lens structure (Figure 3 reference 15a) formed onto said refractive lens element. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the diffractive lens structure of Kamikubo ('164) in a predetermined area on a surface of the refractive lens element in the path of the laser beams directed to the predetermined imaging area of the surface in the scanning optical system of Kamikubo ('029) in order to reduce the difference in the width of the imaging areas for each of the laser beams (Kamikubo ('029) column 6 lines 25 – 28 and Kamikubo ('164) column 4 lines 34 – 36).

Regarding claims 6 and 7, Kamikubo ('164) teaches the diffractive lens structure compensates for a lateral chromatic aberration of said at least one refractive lens element (column 4 lines 34 – 36).

Regarding claim 8, Kamikubo ('029) teaches an optical characteristic of said imaging optical system, within said first range, is configured such that a plurality of beam spots respectively formed by the plurality of laser beams within said imaging area are aligned in the

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scanning direction (Figure 3 reference P_3), while the plurality of laser beams passing through said second range are incident on said beam detector at different timings (references L_0 and L_1).

Conclusion

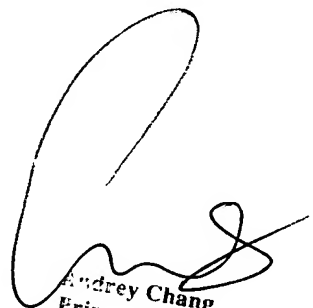
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Denise S Allen whose telephone number is (703) 305-7407. The examiner can normally be reached on Monday - Friday, 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew A Dunn can be reached on (703) 305-0024. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.

Denise S Allen
Examiner
Art Unit 2872


dsa


Audrey Chang
Primary Examiner
Technology Center 2800